

IN THE CLAIMS:

Claims 1-24 (Canceled)

25. (New) An energy distribution network comprising:
- (a) at least one hydrogen generator connected to at least one source of electric energy;
 - (b) at least one hydrogen storage reservoir for storing at least some of the hydrogen produced by said at least one hydrogen generator;
 - (c) a data collector connected to said at least one source of electric energy for collecting data from said at least one source of electric energy.
26. (New) An energy distribution network according to claim 25 wherein said hydrogen generator is a water electrolyser.
27. (New) An energy distribution network according to claim 25, wherein the data collected from the source of electric energy include energy price data.
28. (New) An energy distribution network according to claim 25 wherein the data collected from the source of electric energy include availability of electric energy.
29. (New) An energy distribution network according to claim 28 wherein the electric energy availability data include availability of electric energy from renewable energy resources.
30. (New) An energy distribution network according to claim 25 wherein the data collected from the source of electric energy include the presence of an emergency.

31. (New) An energy distribution network according to claim 25 wherein the data collected from the source of electric energy include the presence of an interruption of electric energy.
32. (New) An energy distribution network according to claim 25, wherein the data collected from the source of electric energy include price data and availability data.
33. (New) An energy distribution network according to claim 25, further comprising a device for converting hydrogen into electric energy.
34. (New) An energy distribution network according to claim 33 wherein said conversion device is a fuel cell.
35. (New) An energy distribution network according to claim 33 wherein said conversion device is a hydrogen powered internal combustion engine.
36. (New) An energy distribution network according to claim 25, wherein the data collected from the source of electric energy includes information on electric energy availability, said information being selected from the group consisting of the amount of energy available, the nature of power available, the time of availability of the energy, the type of energy source available, the unit price per increment of energy available, the duration of delivery of said energy resource, and combinations thereof.
37. (New) An energy distribution network according to claim 25, wherein the data collector further collects data relating to the demand for hydrogen.
38. (New) An energy distribution network according to claim 25, further comprising a hydrogen delivery system for delivering hydrogen to a hydrogen user.
39. (New) An energy distribution network according to claim 25, further comprising a compressor operably connected to at least one of said hydrogen generator and said hydrogen storage reservoir for compressing hydrogen to a desired pressure.

40. (New) An energy distribution network according to claim 39 further comprising a controller for activating at least one of said hydrogen generator and said compressor when the hydrogen pressure falls below a selected minimum value.
41. (New) An energy distribution network according to claim 25 further comprising a controller for activating said hydrogen generator to generate hydrogen when the amount of stored hydrogen falls below a predetermined amount.
42. (New) An energy distribution network according to claim 25, wherein said hydrogen generator generates hydrogen at a minimum desired pressure.
43. (New) An energy distribution network according to claim 38, further comprising a user activation interface for receiving data concerning a demand for hydrogen.
44. (New) An energy distribution network according to claim 25, wherein said data collector collects data comprising information on user demand, energy resource availability, and hydrogen production status.
45. (New) An energy distribution network according to claim 44, wherein information on user demand, energy resource availability, and hydrogen production status are selected from the group consisting of:
 - a. the amount of hydrogen required by said hydrogen user;
 - b. time of delivery of electrical energy to said hydrogen generator;
 - c. duration of period said energy is to be delivered to said hydrogen generator;
 - d. energy level to be sent to said hydrogen generator;
 - e. hydrogen pressure;
 - f. rate of change in hydrogen pressure;
 - g. volume of hydrogen storage reservoir;
 - h. price of electricity and price forecast; and
 - i. combinations thereof.
46. (New) A network according to claim 45, wherein said group further comprises:

- a. rate of energy level or the type of modulation of said energy source to said hydrogen generator; and
 - b. types of electrical energy selected from fossil fuels, hydro, nuclear, solar and wind generated.
- 47. (New) A network according to claim 25, further comprising a hydrogen user.
- 48. (New) A network according to claim 47, wherein the hydrogen user comprises a device for converting hydrogen into electricity.
- 49. (New) A network according to claim 25, wherein said at least one source of electric energy includes electrical conduits of a local area, wide area, or national area electricity distribution network.
- 50. (New) A network according to claim 47, wherein the hydrogen user comprises a device for converting hydrogen into thermal energy.
- 51. (New) A network according to claim 47, wherein said hydrogen user is an internal combustion engine.
- 52. (New) A network according to claim 47, wherein said hydrogen user is an electricity generating fuel cell.
- 53. (New) A network according claim 47, wherein said hydrogen user serves at least one of a plurality of geographic zones associated with at least one building.
- 54. (New) A network according claim 53 wherein said building is selected from the group consisting of an office, plant, factory, warehouse, shopping mall, apartment, and linked, semi-linked, or detached residential dwelling.
- 55. (New) A network according claim 53 wherein at least one of said geographic zones has a zone controller linked to said data collector.
- 56. (New) A network according to claim 47, wherein said hydrogen user is selected from the group consisting of a fuel cell, boiler, furnace, steam generator, turbine/motor generator, catalytic converter, and hydrogen storage facility.

57. (New) A network according to claim 47 wherein there is an exchange of data flow between said data collector and each of said source of electric energy, said hydrogen generator and said hydrogen user.
58. (New) A network according to claim 25, wherein a plurality of said hydrogen generators are provided in said network, and wherein each of said hydrogen generators are linked to said data collector.
59. (New) A network according to claim 25, wherein a plurality of electric energy sources are provided in said network, and wherein each of said electric energy sources are linked to said data collector.
60. (New) A network according to claim 25, wherein a plurality of hydrogen users are provided in said network, and wherein each of said hydrogen users are linked to said data collector.
61. (New) A network according to claim 44 wherein said information on user demand, energy resource availability and hydrogen production status are received and processed by said data collector on an ongoing basis as said data collector controls the production of hydrogen.
62. (New) A network according to claim 61 wherein said data collector processes said information of user demand, energy resource availability, and hydrogen production status to facilitate the production of hydrogen.
63. (New) A network according to claim 25, wherein the production of hydrogen is dynamically controlled by said data collector.
64. (New) A network according to claim 25, wherein a plurality of hydrogen generators are disposed at remote locations from one another and wherein said plurality of hydrogen generators are linked to said network through said data collector.

65. (New) A network according to claim 25, wherein said data collector receives and processes information relating to user demand and hydrogen production status.
66. (New) A network according to claim 25 further comprising a system for delivering hydrogen as fuel to a vehicle.
67. (New) A network according to claim 25 wherein the hydrogen generator is an electrolyser, said network further comprising a hydrogen user, and a controller linked to each of the data collector, the electrolyser, and the hydrogen user to control the production of hydrogen by said electrolyser.
68. (New) A network according to claim 67 wherein said controller controls the production of hydrogen based on inputs including energy resource availability.
69. (New) A network according to claim 67, wherein said controller controls the production of hydrogen based on inputs including user demand
70. (New) A network according to claim 67, wherein said controller controls the production of hydrogen based on inputs including hydrogen production status.
71. (New) A network according to claim 67, wherein said controller controls the production of hydrogen based on inputs including hydrogen storage status.
72. (New) A network according to claim 67, wherein said controller controls the production of hydrogen based on inputs selected from the group consisting of: data pertaining to the nature of the energy resources, data pertaining to the availability of energy from the energy resources, data pertaining to the cost of energy from the energy resources, data pertaining to the operating status of the hydrogen generator, data pertaining to demand criteria specified by said hydrogen user and combinations thereof.
73. (New) A network according to claim 25 wherein the hydrogen generator is an electrolyser, said network further comprising a hydrogen delivery system and a

controller linked to the data collector, the electrolyser, and the hydrogen delivery system to control the production of hydrogen by said electrolyser.

74. (New) A network according to claim 73 wherein said controller controls the production of hydrogen based on inputs including energy resource availability of electric energy.
75. (New) A network according to claim 73, wherein said controller controls the production of hydrogen based on inputs including user demand
76. (New) A network according to claim 73, wherein said controller controls the production of hydrogen based on inputs including hydrogen production status.
77. (New) A network according to claim 73, wherein said controller controls the production of hydrogen based on inputs including hydrogen storage status.
78. (New) A network according to claim 73, wherein said controller controls the production of hydrogen based on inputs selected from the group consisting of: data pertaining to the nature of the energy resources, data pertaining to the availability of energy from the energy resources, data pertaining to the cost of energy from the energy resources, data pertaining to the operating status of the hydrogen generator, data pertaining to demand criteria specified by said hydrogen user and combinations thereof.
79. (New) A network according to claim 25, wherein said data collector receives and processes information relating to user demand, hydrogen production status and hydrogen storage status.
80. (New) A network according to claim 25 wherein said data collector comprises:
 - a. an energy resource processor for processing data concerning energy resources;
 - b. a hydrogen supply processor for processing data concerning hydrogen supply; and

- c. a user demand processor for processing data concerning user demand for hydrogen.

- 81. (New) A network according to claim 80, wherein the data collector controls the production of hydrogen according to data from at least one of said energy resource processor, said hydrogen supply processor, and said user demand processor.
- 82. (New) A network according to claim 25 wherein said hydrogen storage reservoir comprises at least one hydride storage chamber.
- 83. (New) A network according to claim 25 wherein said hydrogen storage reservoir comprises at least one container for storing pressurized hydrogen.
- 84. (New) A network as claimed in claim 25 wherein said at least one electric energy source includes an electricity grid.
- 85. (New) A network as claimed in claim 84 wherein electricity for said electricity grid is produced by at least one primary energy resource.
- 86. (New) A network as claimed in claim 85 wherein said at least one primary energy resource includes one of the following renewable and non-renewable resources: fossil fuels, nuclear, wind, solar and hydro.
- 87. (New) A network as claimed in claim 85 wherein said at least one primary energy resource includes one of the following renewable resources: wind, solar and hydro.
- 88. (New) A network as claimed in claim 84 wherein said energy source data includes real time data.
- 89. (New) A network as claimed in claim 84 wherein said energy source data includes historical data.
- 90. (New) A network as claimed in claim 84 wherein said energy source data includes forecasted data.

91. (New) A network as claimed in claim 84 wherein said energy source data includes energy cost data.
92. (New) A network as claimed in claim 84 wherein said controller modulates the generation of hydrogen by said hydrogen generator based on data including said energy source data.
93. (New) A network as claimed in claim 84 further comprising a device for converting hydrogen into electricity.
94. (New) A network as claimed in claim 93 wherein said controller modulates the generation of electricity by said hydrogen conversion device based on data including said energy source data.
95. (New) A network as claimed in claim 94 wherein at least some of said electricity generated by said hydrogen conversion device is transmitted to said electricity grid.
96. (New) A network according to claim 84 wherein said at least one electric energy source further includes at least one non-grid source of electric energy.
97. (New) A network as claimed in claim 96 wherein electricity for said at least one non-grid source of electric energy is produced by at least one primary energy resource.
98. (New) A network as claimed in claim 97 wherein said at least one primary energy resource includes one of the following renewable and non-renewable resources: fossil fuels, nuclear, wind, solar and hydro.
99. (New) A network as claimed in claim 97 wherein said at least one primary energy resource includes one of the following renewable resources: wind, solar and hydro.
100. (New) A network as claimed in claim 96 wherein said controller selects said electric energy source based on data including said energy source data.

101. (New) A network as claimed in claim 100 further comprising a device for converting hydrogen into electricity.
102. (New) A network as claimed in claim 101 wherein said controller modulates the generation of electricity by said hydrogen conversion device based on data including said energy source data.
103. (New) A network as claimed in claim 102 wherein at least some of said electricity generated by said hydrogen conversion device is transmitted to said electricity grid.
104. (New) A process for controlling a hydrogen energy system comprising the steps of:
 - a. processing data concerning a demand for hydrogen;
 - b. processing data concerning the status of at least one hydrogen storage apparatus;
 - c. processing data concerning the status of at least one hydrogen generator;
 - d. processing data concerning at least one energy source for said hydrogen generator; and
 - e. controlling the generation, storage and delivery of hydrogen in accordance with desired parameters to meet said demand for hydrogen.
105. (New) A process as claimed in claim 104 wherein said energy source data includes data pertaining to the cost of said energy.
106. (New) A process as claimed in claim 104 wherein said energy source data includes data pertaining to the emissions associated with said energy source.
107. (New) A process as claimed in claim 104 wherein said step of controlling the generation, storage and delivery of hydrogen is carried out in order to meet said hydrogen demand at the lowest available cost.

108. (New) A process as claimed in claim 104 wherein said step of controlling the generation, storage and delivery of hydrogen is carried out in order to meet said hydrogen demand using energy having the lowest available emissions.
109. (New) A process as claimed in claim 104 wherein said step of controlling the generation of hydrogen includes the step of modulating the amount of hydrogen generated by said hydrogen generator.
110. (New) A process as claimed in claim 104 further comprising the steps of processing data concerning the status of at least one device for converting hydrogen into electricity and controlling the generation of electricity in accordance with desired parameters to meet a demand for electricity.
111. (New) A process as claimed in claim 104 wherein one or more of said process steps are performed simultaneously.
112. (New) A process as claimed in claim 104 wherein said data for at least one of said process steps is real time data.
113. (New) A process as claimed in claim 104 wherein said data for at least one of said process steps is historical data.
114. (New) A process as claimed in claim 104 wherein said data for at least one of said process steps is forecasted data.
115. (New) A process for meeting a demand for hydrogen comprising the steps of:
 - a. determining the nature of the hydrogen demand;
 - b. determining the availability of energy from at least one energy source;
 - c. determining the status of hydrogen supply; and
 - d. controlling the generation and delivery of hydrogen as required in accordance with desired parameters to meet the hydrogen demand.

116. (New) A process as claimed in claim 115 wherein said step of determining the status of hydrogen supply comprises the steps of determining the status of hydrogen storage and determining the status of hydrogen generation.
117. (New) A process as claimed in claim 116 wherein said step of controlling the generation and delivery of hydrogen as required further comprises the step of controlling the storage of hydrogen as required.
118. (New) A process as claimed in claim 116 wherein hydrogen is delivered from at least one of hydrogen storage and hydrogen generation.
119. (New) A process as claimed in claim 115 wherein said step of determining the availability of energy from at least one energy source includes the step of determining the cost of said energy.
120. (New) A process as claimed in claim 115 wherein said step of determining the availability of energy from at least one energy source includes the step of determining the emissions associated with said energy source.
121. (New) A process as claimed in claim 117 wherein said step of controlling the generation, storage and delivery of hydrogen is carried out in order to meet said hydrogen demand at the lowest available cost.
122. (New) A process as claimed in claim 117 wherein said step of controlling the generation, storage and delivery of hydrogen is carried out in order to meet said hydrogen demand using energy having the lowest available emissions.
123. (New) A process as claimed in claim 117 wherein said step of controlling the generation, storage and delivery of hydrogen includes the step of modulating the amount of hydrogen generated as required.
124. (New) A process as claimed in claim 115 further comprising the step of controlling the generation and delivery of electricity as required in accordance with desired parameters to meet a demand for electricity.

125. (New) A process as claimed in claim 115 wherein one or more of said process steps are performed simultaneously.
126. (New) A process as claimed in claim 115 wherein said step of determining the availability of energy from at least one energy source includes real time data.
127. (New) A process as claimed in claim 115 wherein said step of determining the availability of energy from at least one energy source includes historical data.
128. (New) A process as claimed in claim 115 wherein said step of determining the availability of energy from at least one energy source includes forecasted data.